



**Department of Energy**  
**National Nuclear Security Administration**  
Washington, DC 20585

June 27, 2001

OFFICE OF THE ADMINISTRATOR

Admiral Hank Chiles  
[REDACTED]

Dear Admiral Chiles:

In the National Nuclear Security Administration (NNSA) founding legislation, the organization was entrusted with the responsibility for six missions – one of which is “to support United States leadership in science and technology.” The NNSA is responsible for a broad range of science and technology programs focused on maintaining and enhancing the safety, reliability, and performance of the United States nuclear weapons stockpile, and on detecting the proliferation of weapons of mass destruction worldwide. These programs are primarily supported by the Office of Research, Development and Simulation in Defense Programs (NNSA/DP) for stockpile stewardship, and the Office of Nonproliferation Research and Engineering in Defense Nuclear Nonproliferation (NNSA/NN) for nuclear, chemical and biological WMD proliferation detection and deterrence.

As part of the national security mission, the NNSA has responsibility for the institutional stewardship of the three national security laboratories (LANL, LLNL, SNL). The stockpile stewardship research and development programs are conducted, almost entirely, at these labs, whereas nonproliferation research and engineering programs are conducted at both the national security laboratories and other DOE multipurpose labs (PNNL, ORNL, INEEL, LBNL, BNL, etc.) A key element of the NNSA’s science and technology mission is to ensure that fundamental and applied science programs funded by DOE offices, such as the Office of Science and the Office of Nuclear Energy, continue to be an integral component of the research activities at the national security laboratories. In addition, the NNSA must work closely with the DOE offices responsible for the multipurpose labs (i.e., Office of Science and Office of Environmental Management for INEEL) to ensure that the national security programs at these institutes are integrated into, and supported by, the NNSA portfolio.

Accomplishing the mission to support science and technology leadership for the nation requires a vibrant research environment composed of:

- state-of-the-art experimental and simulation facilities;
- premier diagnostic and analysis capabilities; and
- the best and brightest scientists and engineers



The science and technology portfolio needed for this environment must include an integrated set of programs spanning from fundamental exploratory scientific inquiries to well-defined mission-focused deliverables. This requires integrating:

- “*requirements-driven*” applied research and technology development done in direct support of validated user requirements;
- “*needs-driven*” directed research and technology development done in support of the general needs of a user community in advance of the development of formal requirements; and
- “*basic research*” done to support a strong, multidisciplinary foundation of innovative scientific inquiry.

Today the majority of the R&D funded by NNSA/DP is “requirements-driven”, focused on addressing specific military requirements. In contrast, the majority of the R&D funded by NNSA/NN is “needs-driven”, designed to respond to general problems identified by the external end-users. The national security laboratories rely extensively on Laboratory Directed Research and Development (LDRD) resources to support “needs-driven” science-based stockpile stewardship. Basic research at the three national security labs is supported almost entirely by the DOE/Office of Science (DOE/SC), with some support from other government agencies. A significant percentage of these programs involve university and/or industrial partnerships. Leadership in science and technology requires integrating these efforts into a dynamic portfolio that can meet near-term mission requirements and sustain a premier scientific environment for the long-term.

I charge the NNSA-AC to review the current NNSA research and development portfolio and make strategic recommendations for strengthening NNSA leadership in science and technology. Initially, these studies should focus on the experimental programs in Stockpile Stewardship and Nonproliferation Research and Engineering, with particular attention on three technical areas: proliferation detection, stockpile certification, and nuclear weapons expertise.

- *Proliferation Detection* - NNSA/NN programs that provide innovative technologies and analysis capabilities for detecting nuclear, chemical and biological WMD proliferation.
- *Stockpile Certification* – NNSA/DP programs for certifying systems and qualifying components as part of the stockpile life extension and refurbishment programs (including W88 pit certification) and long-term S&T efforts needed for annual assessments.
- *Nuclear Weapons Expertise* – NNSA/DP programs for recruiting, retaining and certifying the next-generation stewards through advanced concepts research and test readiness.

This study should address the following questions:

1. Are the programs appropriately integrating requirements-driven, needs-driven and basic research?
2. What unique role do these programs play in supporting U.S. national security policy?
3. What unique role do these programs play in supporting leadership for science and technology for the nation?
4. Do these programs have the appropriate strategy and tools (including large-scale and laboratory facilities, diagnostic and analysis capabilities, and human resources) to address both near-term mission requirements and long-term science and technology leadership?
5. Is the philosophy and approach for developing university and industrial partnerships sufficient to meet both near-term and long-term mission needs?
6. Are these programs utilizing and optimizing interlaboratory partnerships (e.g., joint programs and programmatic peer review)?

**Deliverables:**

- Interim reports by November 1, 2001
- Final reports by March 1, 2002

Sincerely,



John Gordon